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ABSTRACT

Researchers are becoming increasingly aware of context variables in interpreting research findings. The Procedures for Adopting Educational Innovations (PAEI) Project at the Texas Research and Development Center for Teacher Education has been attempting to identify and conceptualize important research-based and clinical-based context variables. An implication of this research is that researchers must ask a series of specific questions about the state of an innovation (treatment), rather than implicitly assuming what the influence of contextual variables are on the independent and dependent variables in their research designs. The Concerns-Based Adoption Model (CBAM), specifically the "Levels of Use" concept, aids in determining how an innovation is actually being used and how the innovation itself changes during implementation. The mutations of the innovation have been labeled "configurations." The implication for teacher effects researchers is that both Levels of Use and configurations may vary for any given teacher, and both can be assessed as one way of describing the context. (Author/JD)

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WHAT CONTEXT?
IS IT IN USE?

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Abstract

WHAT CONTEXT? IS IT IN USE?

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Researchers are becoming increasingly aware of context variables in interpreting research findings. The Procedures for Adopting Educational Innovations (PAEI) Project at the Texas R&D Center has been attempting to identify and conceptualize important research-based and clinical-based context variables. An implication of this research is that researchers must ask a series of specific questions about the state of an innovation (treatment), rather than implicitly assuming what the influence of contextual variables are on the independent and dependent variables in their research designs. The Concerns-Based Adoption Model (CBAM), specifically the Levels of Use concept, aids in determining how an innovation is actually being used and how the innovation itself changes during implementation. The mutations of the innovation have been labeled configurations. The implication for teacher effects researchers is that both Levels of Use and configurations may vary for any given teacher, and both can be assessed as one way of describing the context.

WHAT CONTEXT? IS IT IN USE?[1,2]

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As researchers have become increasingly aware of the significance of context variables, the research problems have increased in order of magnitude. New questions are asked. Which context variables are important? How do context variables affect teacher and student interactions? Teacher/child interactions and outcome variables have a long, well-documented history of importance. However, just how important various context variables, such as dimensions of the classroom, the school building, other teachers, the school system, the state, national decisions, issues, and pressures, as well as the home life of the teacher and the student, are is not as clear. Nominating several context variables that our resear h suggest are important is the goal of this paper.

In our research on implementation of innovations in the Procedures for Adopting Educational Innovations (PAEI) Project at the Texas R&D Center, we have been attempting to identify and conceptualize variables that have a

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[1]Preconference draft of a paper presented at the annual meeting of the American Educational Research Association, New York, April 5, 1977.

[2]The research described herein was conducted under contract with the National Institute of Education. The opinions expressed are those of the author and do not necessarily reflect the position or policy of the National Institute of Education, and no endorsement by the National Institute of Education should be inferred.

research base as well as a clinical base that are important for change, innovation implementation, and have implications for teacher effects research. There is a very large number of variables that various researchers, practitioners, and theoretitions have nominated as being important. In some cases, even quantitative research data is available to support the nominations. However, it is not at all clear, given the recent advances in teacher effects research (e.g., the Spring 1976 issue of the Journal of Teacher Education) just how these more traditional variables relate or even if they do relate to the findings of the contemporary teacher effects research.

From our point of view for doing research on implementation, it appears that the first and foremost problem is one of definition. Most of the variables that have been nominated in the past have not been that clearly defined (e.g., What is climate and how does it differ from institutional press?). In addition, for the variables that have been defined by various researchers, there may not be consensus in the definitions across researchers. Thus, in our research, we have had to start from ground zero and attempt to clearly define and operationally define, when possible, the various variables and components of the "context" that we are attempting to understand.

A further problem has been the level of aggregation of the context variables. We think that, for research purposes, it is necessary, and possible, to identify variables that represent some middle ground between highly specific micro-level variables (e.g., number of textbooks in the classroom) and broad, diffuse macro variables (e.g., leadership style). There has to be a middle ground of aggregation that would represent selected, important dimensions of the context, that are narrow enough to be measured, yet broad enough to account for significant variance in the change process.

The experience base and past research that preceded the PAEI Project was synthesized into a model of the dynamic, systemic process of change in schools and colleges. This model, the Concerns-Based Adoption Model (Hall, Wallace, & Dossett, 1973), proposes several variables that represent different parts of the context of change.

The Concerns-Based Adoption Model (CBAM) is based on several assumptions. These assumptions include the following:

(a) The individual teacher or college professor has to be the primary frame of reference for studying implementation and consequently teacher effects research. Viewing implementation of innovations in a context from the very larger levels, such as a school building or the school system level, will not allow us to focus in on what is really happening to individual children in the classrooms. The unit of analysis for the study of implementation, as well as for the study of teacher effects, has to be the individual teacher.

(b) The implementation of innovations, whether it be teaching process innovations, curriculum product innovations, or organizational innovations, must be viewed as a process and not an event.

(c) For the end product, the process of implementing innovations entails developmental levels, which can be identified.

(d) Characteristics of the innovation, its scope, and how it is perceived by the user make a tremendous difference in the success of implementation efforts.

(e) There are school-level variables that do make a difference.

(f) The entire process of implementing an innovation by the

individual classroom teacher must be considered as taking place within a larger system -- the building, the school system, and probably the community. The implementation of innovations must be viewed systemically.

(g) Consequently, the implementation of an innovation must be viewed as an adaptive, interactive, ongoing developmental process, rather than being viewed as some sort of dichotomous yes/no, go/no go, decision point.

If these assumptions are verified through research, then teacher effects researchers will have to consider more closely their implicit assumptions about the influence of contextual variables on the independent and dependent variables in their research designs.

In order to more clearly document and illustrate potential implications of these assumptions, the researcher needs to consider several questions as he/she (a) designs studies, (b) collects data, (c) analyzes data, and (d) interprets findings. Rather than implicitly assuming the answers, researchers need to document their answers to each of the following questions:

(a) Is IT there?

(b) Do they all use IT the same way?

(c) Does use of IT change over time?

(d) What shape is IT in?

(e) What is IT like across teachers within the same building?

The term "IT" is used advisedly in the development of these questions. Based upon our research in both school and college settings, it appears that both simple and complex processes and products can be viewed as "innovations." For purposes of this discussion, various behaviors and competencies demonstrated in the teaching/learning act and the conditions surrounding the teaching/learning

act may be viewed as "innovations." Also, since we assume that change is a process, both long-term users and nonusers can be talked about as being users and nonusers of an "innovation." In order to minimize confusion, however, rather than talking about team teaching and asking probing questions as being innovations, I will use the term "IT." You'all can then plug relevant "ITs" in from your situations.

In the remainder of this paper, each of the five questions will be briefly discussed and illustrative data will be presented to emphasize the importance and implications of these questions and the assumptions of the Concerns-Based Adoption Model for developing and describing the context within which interpreting teacher effects research is possible.

Question 1: Is IT there?

"Is IT there" is really subdivided into two key questions. These questions are "What is IT?" and "Is IT in use?" Our research has shown repeatedly that determining exactly "what IT is" that is being implemented is not as simple and straightforward as has been assumed. The developers of innovations present brochures and descriptive packets and will tell you very clearly what IT is. Policy makers, curriculum supervisors, administrators in school systems, and college and university faculty will all do fairly well at repeating the developer's definition of IT.

However, our research has shown repeatedly that the users, teachers and professors in classrooms, do not define IT in the same ways the developers and promoters do. Rather, the users develop their own language, structures, and handholds to organize and describe IT.

The first question then, "What is IT?", needs to be approached and answered not solely from the developer's point of view, but also from the user's

point of view. Our approach to this definitional problem is to begin with in-depth discussions with the developer. We then conduct first-hand interviews with users of IT and out of the user's definition, attempt to develop the user's structure or configuration(s) of the innovation. Data collection, analysis, and interpretation then proceed with the user's definition being the basis of the research. The definition of what IT is is based upon the reality of the classroom as represented by practitioners rather than the idealized definition as proposed by the developer. I'll come back to the innovation configuration concept later in this paper.

The second subquestion of "Is IT in use?" has even more direct and profound implications for researchers and evaluators. Traditionally, researchers and evaluators set up well-established research designs that have "comparison" groups and "treatment" groups, or "control" groups and "experimental" groups. It appears that in most of these studies, it is implicitly assumed, rather than directly verified, that if one samples in an "experimental" school, IT will be in use, and if one samples from a "control" school, IT will not be in use. The basis for determining a treatment school and a control school generally relies on the testimony of some "expert" witness such as a principal or superintendent. It appears that as long as the X's and O's are in the right boxes within the research design, what is really happening in those classrooms is assumed with too much faith.

Our research has shown that the testimony of secondary sources, such as school superintendents and central office personnel, are not that valid for determining what is actually going on at the school building level -- never mind the classroom. As a matter of fact, the more direct source of the school principal is not always an accurate source of information about what is actually going on in a classroom with IT.

For example, in our study, we collaborated with the Austin Independent School District in their well-designed evaluation of IGE. The AISD evaluation plan identified eleven experimental schools which had been using Individually Guided Education (IGE) for three years and eleven comparison schools that were matched according to various demographic, teacher, and student variables. The evaluation study was well designed, well developed, and well carried out. As a part of this work, the AISD Office of Evaluation and Research allowed us to participate from the point of view of our research on implementation. In that collaborative effort, we collected direct first-hand information about whether or not various components of IGE were in fact implemented in the "treatment" schools and were in fact not in use in the "comparison" schools.

The basis for collecting these data was the Levels of Use Interview (Loucks, Newlove, & Hall, 1976) procedure which will be described in more detail later in this paper. At this point, suffice it to say that the interview procedure has been demonstrated to be highly reliable and valid in determining use versus nonuse of an innovation.

As illustration of the constant definitional problems, take the "innovation" of Individually Guided Education (IGE). Rather than IGE being viewed as an innovation, it is in fact an innovation bundle. IGE consists of a combination of specific innovations, such as teaming, a differentiated staffing pattern, multi-age grouping of students, individualized instruction, etc. In this study, rather than assessing whether or not the innovation of IGE was present or absent, we assessed whether or not specific components of the IGE innovation bundle were present or absent. Since the AISD Office of Evaluation and Research was interested in student achievement in reading and mathematics, we selected the innovations of individualized instruction in reading and individualized instruction in mathematics as the two innovations that would be

assessed for use or nonuse, the assumption being that use or nonuse of individualized instruction would be most likely to correlate with learning outcomes in reading and mathematics.

Levels of Use Interviews were conducted with second and fourth grade teachers -- sixty-nine teachers in the IGE schools and sixty-five teachers in the non-IGE schools. The use/nonuse findings are summarized in Figure 1. For both individualized instruction in reading and mathematics, the "treatment" and "comparison" groups were not pure. A large proportion of the comparison samples were users of the innovations.

In analyzing these data, exactly opposite results were obtained, depending on the comparison groups (Loucks, 1976; Hall and Loucks, 1976). When the IGE group was compared to the non-IGE group, there were no significant differences in learning outcomes. However, when users of individualized instruction were compared with nonusers, the differences were statistically significant in favor of individualized instruction.

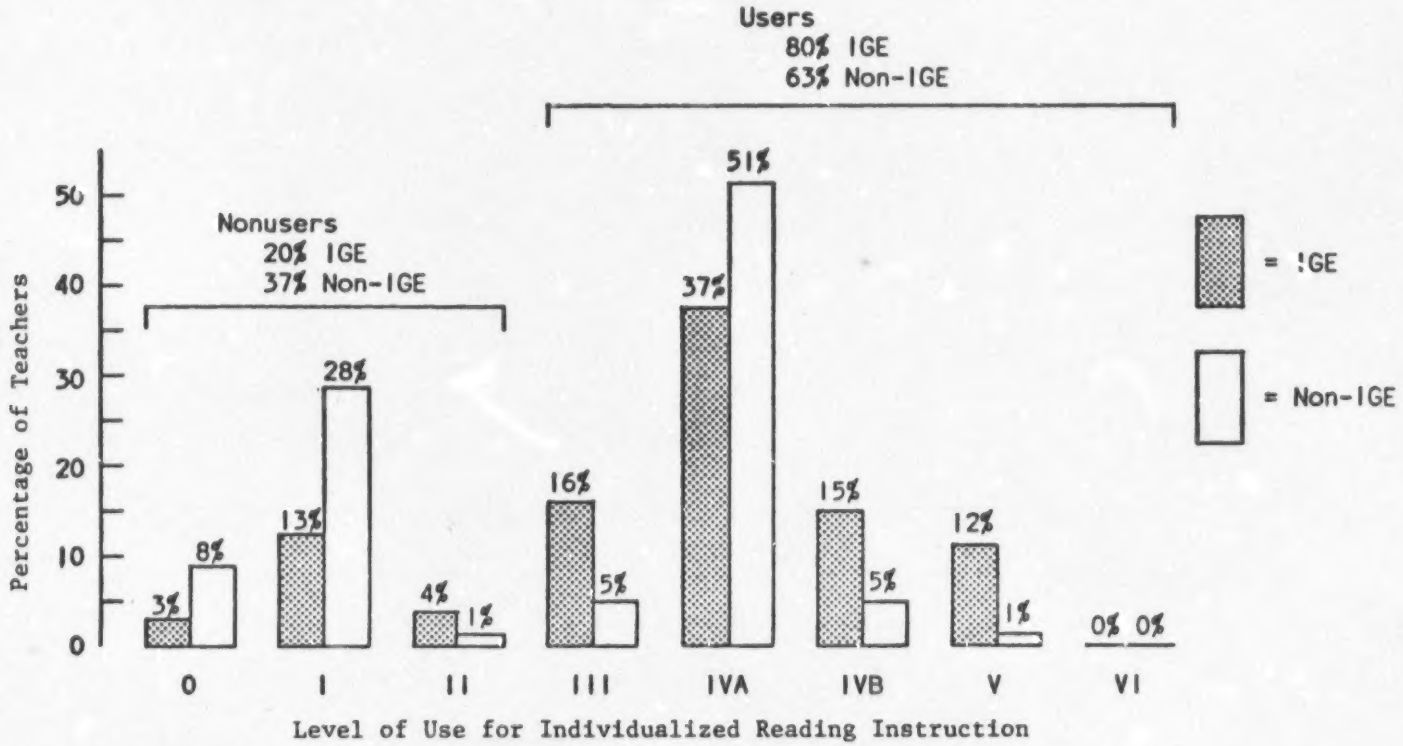
In summary, teacher effects researchers need to document implementation and non-implementation of their dependent variables before they interpret their findings. Testimony and sampling designs are not sufficient. As one example, Stallings and Kaskowitz (1974) carefully documented the use and nonuse of the "ITs" in their Follow-Through studies before the treatment groups were selected.

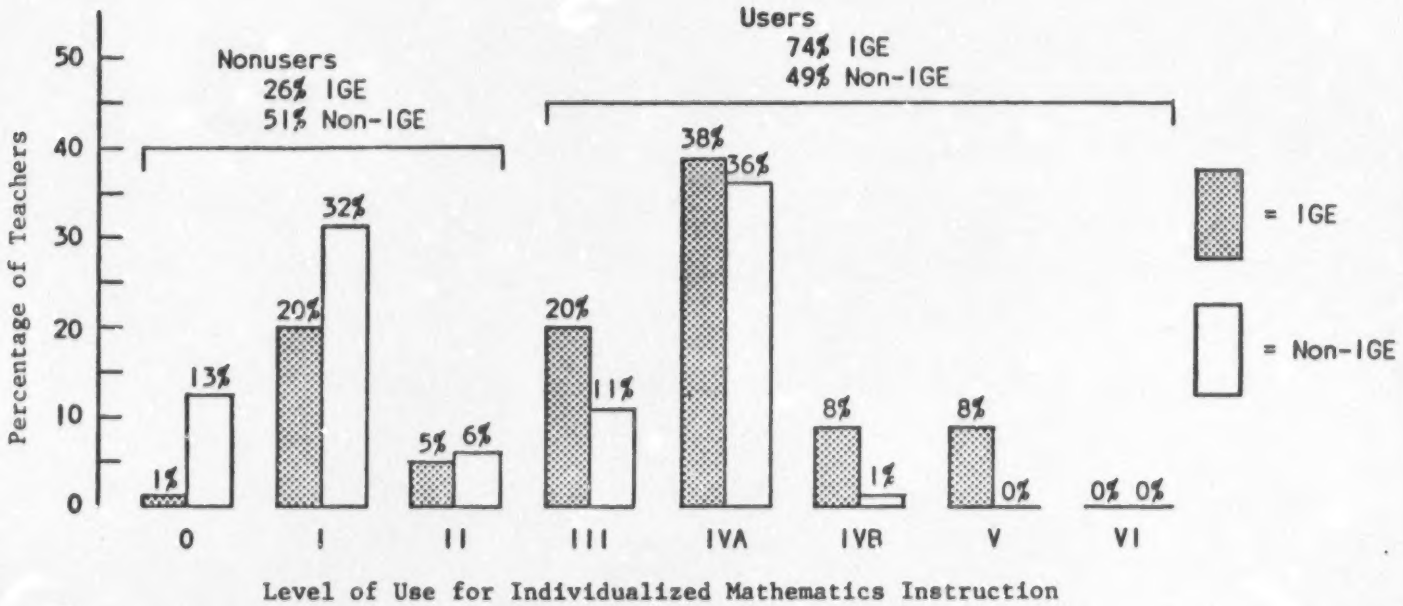
Question 2: Do they all use IT the same way?

Unfortunately, the question is not as simple as "Is IT in use?" In the Concerns-Based Adoption Model, it was proposed that there are different "levels of use" of an innovation (Hall, Loucks, Rutherford, & Newlove, 1975). In fact, through our initial research to verify the concept of Levels of Use,

Figure 1

Distribution of Teachers According to Overall Level of Use of Individualized Instruction Across IGE and Non-IGE Schools





it has been verified that there are at least three different nonuse levels and five different use levels that individuals demonstrate.

As proposed in the Concerns-Based Adoption Model, the concept of Levels of Use of the Innovation focuses on the actual behaviors and performance of the individual in relation to the innovation. These behaviors range from "nonuse" behaviors of orienting oneself to the innovation, through reviewing materials and acquainting oneself with the components of the innovation, to an early use that is "mechanical" where the user is uncoordinated and planning is short-term in focus. Later on, highly collaborative and impact-oriented uses of the innovation may be demonstrated. These different Levels of Use are summarized in Figure 2.

As a part of the research during the last three years, the procedures for assessing Levels of Use have been developed. Since Levels of Use of the Innovation represents the individual performance outside of the classroom as well as inside of the classroom in relation to IT, direct observation was not considered to be cost-feasible. Instead, a focused interview procedure that uses a branching technique based upon the operational definitions of Levels of Use was developed (Loucks, Newlove, & Hall, 1976). The interviewer uses a branching format during the interview and follows up with specific probes in an attempt to develop a full picture of activities and knowledge the individual is demonstrating in relation to IT.

This interview procedure has been used in over 3,000 interviews as part of our cross-sectional and longitudinal studies. Interviewer reliabilities have consistently been in the range of .87 to .96. In a recent study, the validity of the Levels of Use Interview procedure was checked by contrasting Levels of Use ratings of interviewers as contrasted with the ratings of Levels of Use assigned by ethnographers. The ethnographers spent an entire day with

Figure 2

Levels of Use of the Innovation*

0 NONUSE: State in which the user has little or no knowledge of the innovation, no involvement with the innovation, and is doing nothing toward becoming involved.

I ORIENTATION: State in which the user has recently acquired or is acquiring information about the innovation and/or has recently explored or is exploring its value orientation and its demands upon user and user system.

II PREPARATION: State in which the user is preparing for first use of the innovation.

III MECHANICAL USE: State in which the user focuses most effort on the short-term, day-to-day use of the innovation with little time for reflection. Changes in use are made more to meet user needs than client needs. The user is primarily engaged in a stepwise attempt to master the tasks required to use the innovation, often resulting in disjointed and superficial use.

IVA ROUTINE: State in which use of the innovation is stabilized. Few if any changes are being made in ongoing use. Little preparation or thought is being given to improving innovation use or its consequences.

IVB REFINEMENT: State in which the user varies the use of the innovation to increase the impact on clients within immediate sphere of influence. Variations are based on knowledge of both short- and long-term consequences for clients.

V INTEGRATION: State in which the user is combining own efforts to use the innovation with related activities of colleagues to achieve a collective impact on clients within their common sphere of influence.

VI RENEWAL: State in which the user reevaluates the quality of use of the innovation, seeks major modifications of or alternatives to present innovation to achieve increased impact on clients, examines new developments in the field, and explores new goals for self and the system.

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*Excerpted from: The LoU chart: Operational definitions of Levels of Use of the Innovation. Austin: Procedures for Adopting Educational Innovations/ CBAM Project, Research and Development Center for Teacher Education, the University of Texas, 1975.

a teacher from the time they arrived at school in the morning to the time they left at the end of the day. The correlation between the interviewer's rating and the ethnographer's rating was .98, thus indicating that at least in this study there was a high degree of correspondence between the information obtained by the interviewer in twenty to thirty interviews with the information obtained by the ethnographer in an all-day documentation period.

During the fall of 1974, two two-year longitudinal studies were begun in which the Levels of Use Interview procedure was used to assess the Levels of Use of two stratified samples. The purpose of these studies was to initially verify the existence of the Levels of Use that had been hypothesized and also to collect some initial data about the movement from level to level of individual users and nonusers. One study involved approximately 400 teachers in elementary schools in Texas, Nebraska, and Massachusetts, and the innovation was "teaming." The second study involved approximately 350 college faculty mainly in teacher education institutions in relation to use and nonuse of instructional "modules." The samples were stratified according to experience with use of the innovation. For each study, there was a sample of individuals who had no experience with the innovation, as well as samples who had had one, two, three, four, or more years of experience with the innovation.

The summary of the overall Level of Use rating for these individuals for the fall 1974 data are summarized in Figure 3. As can be seen in Figure 3, individuals were identified at each Level of Use. In addition, for both nonusers, which would be Levels of Use 0, I, and II, and users of the innvoation, LoU III-VI, the proportion of individuals at each level is unequal. In these data as well as in other data (Hall, 1977; Loucks, 1977a; Loucks, 1977b; LaShier, 1977), it appears that in stratified samples, Level of Use IVA Routine will generally encompass about fifty percent of the sample of users. Obviously

the nonuser sample will vary depending upon the number of nonusers that are selected.

Figure 3

Percentage Distribution of Overall Level of Use for Two Innovations

LEVELS OF USE	TEAMING IN ELEMENTARY SCHOOLS		INSTRUCTIONAL MODULES IN COLLEGES	
	Absolute Frequency	Percentage	Absolute Frequency	Percentage
0 Nonuse	29	7.2	36	10.3
I Orientation	36	9.0	106	30.2
II Preparation	10	2.5	34	9.7
III Mechanical Use	80	19.9	27	7.7
IVA Routine	208	51.7	78	22.2
IVB Refinement	22	5.5	37	10.5
V Integration	11	2.7	24	6.8
VI Renewal	6	1.5	9	2.6
	402	100.0	351	100.0

In summary, the implication for teacher effects researchers is that the number of individuals at a given Level of Use will vary. The variation will depend upon factors such as years of experience and support for the implementation effort. In addition, the innovation has to be a positive innovation or actual use of the innovation may not be demonstrated at all. The question for the teacher effects researcher is not simply "Does use of IT have to be assured?" but in addition, "How does use of IT vary across levels?" Further, although the data are poor, it can be hypothesized that at different Levels of Use, very different outcomes (effects) will be observed in the clients of the users of the innovation (Loucks, 1975; Hall & Loucks, 1976).

Question 3: Does use of IT change over time?

For teacher effects researchers, if Levels of Use data were collected just at the beginning of the study, they would still be holding the assumption that Levels of Use remain constant over time. However, since there has been demonstrated different Levels of Use, it is likely that at some point and in some way Levels of Use for individuals change. As our research demonstrates, some individuals remain at some Levels of Use longer than they do at others, and for some individuals, once they reach certain Levels, they are not likely to move from there. For example, we have found that many individuals, once they reach a Level of Use IVA Routine, tend to remain there (Hall, 1977).

One interesting example that has direct implications for teacher effects researchers is the frequency of Level of Use III, Mechanical individuals and how they change with increasing experience with the innovation. In Figure 4, the LoU data from Figure 3 is cross-tabulated with the individuals' self-reported years of experience with the innovation.

As can readily be seen, the first-year users have a much higher proportion of persons at Level of Use III Mechanical than do more experienced users. Further, the proportion of individuals at Level of Use III decreases with increasing experience. Interestingly, it takes longer for teamers to move beyond LoU III than module users. Evaluators and teacher effects researchers need to keep this in mind, especially in conducting experimental studies and conducting summative evaluations of new products. Chances are that most, if not all, of the individuals who are using an innovation or a "treatment" for the first time will be functioning at a Mechanical Level of Use. It is not likely that at a Mechanical Level of Use, teachers will be getting the idealized effects that the researcher expects of the treatment group. Perhaps experimental studies and summative evaluation studies should be done with LoU IVA Routine users?

Figure 4

Comparison of Levels of Use of Teaming by Years of Experience

LEVELS OF USE		YEARS OF EXPERIENCE				
		No Experience	1 Year	2 Years	3 Years	4 or More Years
0	Nonuse	27.4%	2.9%			3.7%
I	Orientation	38.7%	4.9%		1.4%	3.7%
II	Preparation	1.6%	7.8%	3.8%		
III	Mechanical Use	21.0%	35.0%	15.4%	11.3%	9.2%
IVA	Routine	9.7%	42.7%	76.9%	71.8%	67.0%
IVB	Refinement		4.9%		8.5%	9.2%
V	Integration		1.9%	3.8%	7.0%	2.8%
VI	Renewal	1.6%				4.6%
TOTAL N = 371	n =	62	103	26	71	109

Comparison of Levels of Use of Modules by Years of Experience

LEVELS OF USE		YEARS OF EXPERIENCE				
		No Experience	1 Year	2 Years	3 Years	4 or More Years
0	Nonuse	17.9%	3.2%		6.3%	9.1%
I	Orientation	62.4%	7.9%	17.0%	6.3%	9.1%
II	Preparation	15.4%	9.5%		3.1%	
III	Mechanical Use	.9%	17.5%	8.5%	9.4%	12.1%
IVA	Routine	1.7%	31.7%	44.7%	31.3%	30.3%
IVB	Refinement	.9%	17.5%	17.0%	28.1%	12.1%
V	Integration	.9%	9.5%	8.5%	9.4%	24.2%
VI	Renewal		.7%	.7%	.7%	.3%
TOTAL N = 292	n =	171	63	47	32	33

Question 4: What shape is IT in?

Contrary to the assumption that was held in the early '60's that it was possible to develop "teacher proof" curriculum packages, it is readily demonstrated by our Levels of Use research from the moment that the innovation is introduced. Teachers are busily adapting it to fit their situation and the kinds of needs that are most pressing at various points during the implementation process.

Another way to view Levels of Use is to think of the individual users in relation to the ways they are adapting the innovation. Mechanical Level of Use individuals are adapting the innovation for user-oriented reasons so that it can be functioning more efficiently for them, whereas a Level of Use V Integration individual is adapting the innovation through collaborating with his/her peers in an attempt to increase student outcomes.

The result is that IT changes during the implementation. IT is constantly undergoing mutations of one type or another, dependent upon the Level of Use of the teacher. As IT is modified by each individual, some mutated forms are more common than others. In our research, we have attempted to identify elements of these forms that are common across teachers. We have been able to identify different innovation elements or dimensions that are characteristic of that innovation and the way teachers vary it. We have given the label of configurations to these frequently found mutant forms.

As a part of our present research, we are attempting to study the development and evolution of configurations by following a large number of teachers as they implement various innovations. We are attempting to develop a generic process for identifying configurations across innovations, as well as attempting to understand how configurations evolve. It is clear that teachers, based upon their definitions of the innovation and the hand-holds that they have developed, will structure, organize, and adapt the innovation differently.

For example, in Figure 5 is the data for one teacher in relation to the Jefferson County Mathematics Curriculum of the Jefferson County Public Schools in Colorado. The Jeffco Math Program is a continuous progress, objectives based package with an array of alternative instructional modules. Based on interviews, we have identified the following configuration elements that vary and at the same time define operationally this innovation from the users' point of view:

1. use of objectives
2. materials used
3. grouping
4. testing
5. use of test results
6. record keeping

We have found in our research that these configuration elements can be used to identify and describe different configurations. For example, some teachers use the objectives in sequence while other teachers use the objectives out of sequence. Some teachers have a large heterogeneous group, while another teacher may have three small homogeneous groups, or individual assignments. By looking across individual teachers, certain dominant patterns or configurations have been identified (Figure 6).

The implication for teacher effects researchers again is that, along with different Levels of Use, the configuration of IT may vary for any given teacher. Without documenting the configuration(s) that is present, there is no certainty that the teacher is using the same configuration, which was explicitly assumed in the sampling design. Incidentally, we assess configurations through a "configuration hunt" at the opening part of the Levels of Use Interview, so additional data collection points are not needed.

Figure 5

Configuration Data for One Teacher for Jefferson County Math Curriculum

I.D. Teacher A School 109

JEFFCO MATH STUDY

	1973-74	1974-75	1975-76	Fall 76	Spring 77
JEFFCO OBJECTIVES				in sequence	
MATERIALS				texts emphasized	
GROUPING				large group(s) heterogeneous	
TESTING				objectives and clusters	
TEST USE				group continues - extra help	
RECORD KEEPING					

Figure 6

Configuration Patterns of Nine Teachers for Jefferson County Math

UTR&D
1/24/77

JEFFCO MATH STUDY DATA

School 105

Teacher	Objectives	Materials	Grouping	Testing	Test Use
1	In sequence	Combination	Small groups -- flexible	Objectives and clusters	Next steps for individual
2	In sequence	Combination	Large group(s) -- homogeneous	Objectives and clusters	Group continues, extra help
3	In sequence	Combination	Large group(s) -- homogeneous	Objectives and clusters	Group continues, extra help
4	In sequence	Combination	Small groups -- flexible	Objectives and clusters	Next steps for individual
5	In sequence	Combination	Other	Objectives and clusters	Next steps for individual
6	In sequence	Combination	Other	Objectives and clusters	Next steps for individual
7	In sequence	Combination	Other	Objectives and clusters	Next steps for individual
8	In sequence	Combination	Other	Objectives and clusters	Group continues, extra help
9	In sequence	Combination	Large group(s) -- homogeneous	Objectives and clusters	Group continues, extra help

19

Question 5: What is IT like across teachers within the same building?

As was alluded to in analyzing Question 4, our configuration data as well as the Levels of Use data indicate that various teachers within the same building may conceivably be using different configurations of IT. Figure 7 summarizes the configuration data from one school where there is a great deal of variation across teachers in the configuration of Jeffco Math. In other school buildings, we have found that configuration data is identical across all teachers.

Again, the implication for teacher effects researchers is that without checking the configurations that are in use in each and every classroom within the study, it cannot be safely assumed that all classrooms are using the same configuration of IT. If variation in configuration is not important in terms of the hypotheses being tested, then perhaps less attention can be given to configurations. However, in most studies, it seems conceivable that variation in key configuration elements could significantly affect the effects that are being studied.

One of the aspects of our present research, besides looking at the "evolution" of configurations from the point of implementation to full institutionalization, is studying the effects of interventions upon Levels of Use, configurations, and the "concerns" of innovation users (Hall & Rutherford, 1976). One hypothesis that has been developed out of the configuration work is that the principal makes a significant difference in determining the consistencies or inconsistencies of configurations across teachers. This is an area that we are pursuing further in our own research by attempting to identify what characteristics of the unit leader, the school building principal, and other personnel affect increases and decreases in the consistency of configurations across classrooms.

Figure 7

Configuration Patterns of Jefferson County Math for Teachers Within One School

UTR&D
1/24/77

JEFFCO MATH STUDY DATA

School 124

Teacher	Objectives	Materials	Grouping	Testing	Test Use
1	In sequence	Jeffco emphasized	Small groups -- flexible	Objectives and clusters	Group continues, extra help
2	In sequence	Combination	Jeffco	Objectives and clusters	Next steps for individual
3	Out of sequence	Text	Small groups -- flexible	Other	Next steps for individual
4	Out of sequence	Combination	Small groups -- flexible	Objectives and clusters	Group continues, extra help
5	Out of sequence	Combination	Large group(s) -- homogeneous	Objectives and clusters	Group continues, extra help

Summary

Note that in this paper there has been no extensive discussion of what context is, or an attempt to define context. Rather, based upon our research on change, we are suggesting that, from the point of view of assessing the effects of teachers, it is possible to look at several change variables that will serve as indicators of the accumulative effects of the many proximal and distal acts, conditions, and events that comprise context. Teacher effects researchers do not need to become change researchers in order to account for the context. They can be reasonably safe in assuming that the impact of context can be assessed by focusing on the teacher and using the innovation (IT) as the frame of reference.

Moving back away from the individual teacher to looking at principal leadership style, organizational climate and other such variables are probably not necessary and certainly not likely to be affordable. Using key teacher and innovation centered variables that represent the accumulative impact of these more traditionally recognized context variables as they impact the individual teacher will do the job effectively. It is at the individual teacher level that the teacher effects researcher is focusing, and thus the impact of the context should be assessed from the frame of reference of that individual teacher. In this paper, we have proposed Levels of Use of the Innovation and the concept of configurations as two ways to document the effects of context at the individual teacher level.

In summary, there are several implications that can be drawn from each of the questions that were listed at the beginning of this paper.

(a) There needs to be systematic data collection that documents the presence or absence of the "treatment" for each user and nonuser. Research with the CBAM consistently shows that assuming use and nonuse is not at all a safe assumption. This needs to be documented using valid procedures.

(b) We know that there are eight different Levels of Use of an Innovation. We have proposed that hypothesizing that at different Levels of Use there are different effects. This is a hypothesis that we would like to test through collaborating with our teacher effects colleagues. In a collaborative study of this type, we could do the context/implementation side, and they could do the teacher effects side. If it indeed is true that at different Levels of Use there are different effects, then these different Levels of Use need to be documented before the effects of the teacher can be sorted out.

(c) In an extended study, Levels of Use needs to be assessed more than once. We know that individuals' LoU change over time. If LoU represents an important estimate of the context, then changes in LoU need to be documented. Otherwise, the unaccounted for variance in LoU may become very large over an extended period of time.

(d) When implementing an innovation (IT), the user will make adaptations in it by definition. There will be different configurations to it as a result. Systematic documentation of the configuration is critical in attempting to draw a relationship between the teacher and students. Some configurations may have more significant effects than others. How much mutation in configurations is allowable and still have the innovation (IT) in use? How does the actual operational configuration relate to the developer's idealized description?

(e) There is likely to be variation in configurations across teachers, even if they have the same training. Depending upon their Level of Use and the role of the principal or other supervisory personnel and the available resources, the configurations may be very consistent or inconsistent across teachers and across schools. Again, this argues for careful documentation of configurations for each member of the "treatment" and "comparison" groups.

A basic assumption of the Concerns-Based Adoption Model is that change is a process, not an event. If researchers, evaluators, program developers, staff developers, and decision makers accept this assumption, then they have to act accordingly. This means that research studies cannot assume a nonuse/use dichotomy. In order to identify teacher effects, the affect of the context as it impacts the teacher and the innovation must be accounted for. At the individual level, Levels of Use of the Innovation and configurations are two potentially viable dimensions for estimating the context. Whether or not they turn out to be as significant as is argued in this paper will only be known after they are tested in selected studies.

We invite our colleagues in teacher effects research, as well as evaluators and others, to share in this exploration. If the concepts and procedures hold up, there are many intriguing implications for research evaluation, staff development, decision-making, and for planning and facilitating the change process.

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